

12

A REPORT
ON THE
SANITARY CONDITION
OF THE
BOROUGH OF NOTTINGHAM.



PRESENTED
by James
AUTHOR.

BY

EDWARD SEATON, M.D. LOND., M.R.C.P.,

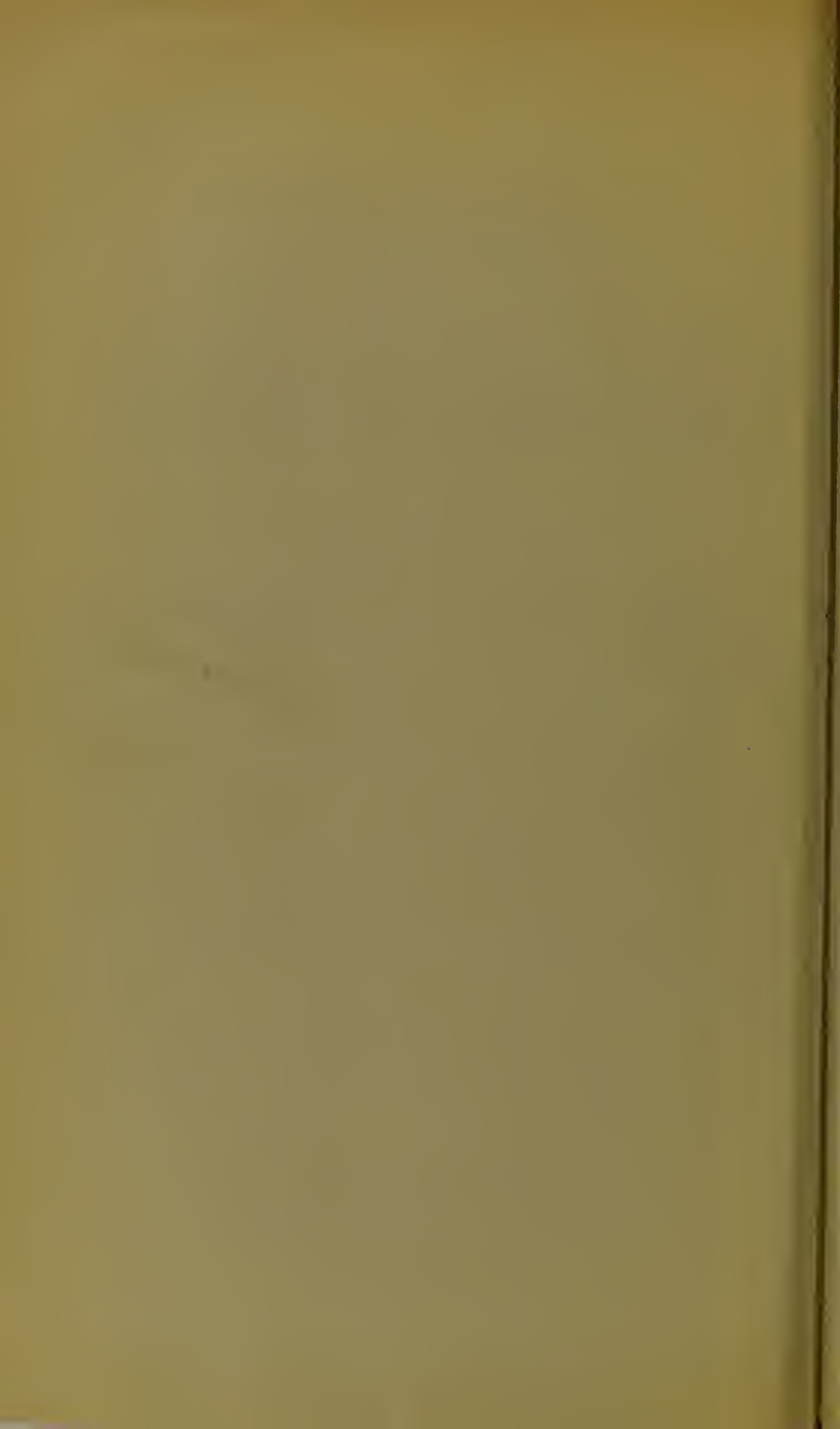
MEDICAL OFFICER OF HEALTH TO THE BOROUGH.

NOTTINGHAM:

PRINTED BY RICHD. ALLEN AND SON, CAXTON HOUSE.

1873.

Mh 28



CHAPTER I.

LOCALITY AND GEOLOGICAL POSITION OF THE BOROUGH.— DESCRIPTION OF THE SEVERAL WARDS.—SEWERAGE OF THE TOWN.

THE town of Nottingham is situated on the southern extremity of a range of hills, which have their termination on the north side of the large valley of the river Trent, and which extend in a northerly direction to a considerable distance. The centre of the town is about a mile and a quarter from the banks of the Trent, and the configuration of the borough represents a very irregular and indented area, the width of which, at the narrowest portion from east to west, is about three quarters of a mile, and the length of which, from the north-eastern to the south-western extremities, is about three miles and a quarter. The borough is bounded on the east by the populous parish of Sneinton, the inhabited portion of which immediately abuts on the most densely populated part of the town; on the west by the extra parochial liberties of the Park, and by the populous parish of Radford; on the south by the river Trent and the Meadows in the alluvial valley thereof; and on the north and north-east by the high and sparsely populated country forming part of the old Sherwood forest. With the exception of the district called the Meadows, which comprises the land between the south escarpment of the hills and the river Trent, which is low and liable to be flooded, the town, generally, has undulating surfaces, some of which are somewhat steep, the rainfall rapidly passes away from the ground and floods over two watersheds into the valleys, known as the

Beck and the Leen, before reaching the Trent. The level of the summer water of the river Trent, at the Nottingham bridge, is 67 feet above mean or half tide level at Hull. The centre of the town is about 53 feet above the aforesaid Trent level, and the highest point of the borough at the north-east end is about 353 feet above that level. Though the area of the borough comprises no less than 1996 acres, a large portion of the land is as yet not built upon, and that part which is inhabited has its population unequally distributed. The class of houses also varies very much in the different parts of the town. Before the year 1845, the inhabited portion of the town was completely surrounded by commonable lands which could not be built on, it hence became very overcrowded. Building operations were confined within the borough limits, and in consequence "back-to-back" houses, of which 8000 still remain, were constructed in large numbers, and narrow unventilated yards and alleys, which were densely populated, became numerous. In 1845, however, an Act was passed for enclosing and building on the commonable lands. Commissioners were appointed to carry the act into execution, and thus what is known as the New Town sprung up around the Old Town. Those who were concerned with the framing of this Act, doubtless having in view the evils which arose from the building of high back-to-back houses in the narrow streets of the Old Town, resolved to introduce clauses which should render the erection of such dwellings impossible. In their anxiety to guard against this particular evil, they rushed into the other extreme. Thus the Act contains certain provisions which necessitate the construction of buildings of a somewhat superior class; each house being required to have at least three bedrooms above the ground floor, and an attached yard or garden extending to at least 30 feet from the dwelling. These and other limitations, as will be seen hereafter, have proved serious obstacles to the natural growth of the town.

The borough is divided for registration purposes into seven Wards. It will be convenient here to enter into a brief description of each of them separately.

SHERWOOD—Population $\left\{ \begin{array}{l} \text{Males, 6,841: Old Town,}^a \text{ 3,299.} \\ \text{(1861), 12,572. (1871) } \left\{ \begin{array}{l} \text{Females, 9,189: New Town, 12,723.} \\ \text{16,022.} \end{array} \right. \end{array} \right.$

Number of Inhabited Houses, 3,253.

Character of Houses. Villa Residences.^b New Enclosure houses.^c
Back-to-back houses.

Comprises a very small portion of the Old Town: part of this, however, which consists of a block of buildings lying between the Long Row and Parliament Street, forms a specimen of some of its worst localities. For the rest, the Ward is composed almost entirely of good streets, lined with houses of various descriptions and sizes, the smallest of which conform to the requirements of the New Enclosure Act. From the Market-place it stretches away in a direction due north, having a portion of Park Ward and the Parish of Radford abutting it on the west, and being divided from its neighbour, St. Ann's Ward, on the east, by the Mansfield Road. Its northern limit is the part known as the Forest. One of the most notable features in this Ward is, that it contains two fine large open spaces—one of which is the beautiful recreation ground known as the Arboretum, and the other the General Cemetery. There is also a smaller space, which is not yet built on, and which is at present used as a Cattle Market. As regards soil and elevation the position of the Ward is most favourable, the whole of it being on the Sandstone rock, which rises almost continuously to a considerable height, at its northern extremity, the Forest.

(a) The section comprised in the Old Town, is here intended only to include that portion of Sherwood Ward that lies between the Market Place and Parliament Street. A long tongue of the old part of this Ward stretches away to the north, but, as it was impossible to reckon the population of this part separately, it has been necessarily included with the new.

(b) The term "Villa Residences" is meant to denote all houses of a superior class, inhabited by people who employ domestic servants.

(c) The term "New Enclosure Houses" is meant to include all those houses of such size as only just to comply with the requirements of the Act. They are occupied almost exclusively by artisans and factory operatives.

ST. ANN—*Population* (1861), 20,079. (1871), $\left\{ \begin{array}{l} \text{Males, 11,290: Old Town, 9,549.} \\ \text{Females, 12,939: New Town, 14,680.} \end{array} \right.$
24,229.

Number of Inhabited Houses, 4,810.

Character of Houses: Back-to-back. New Enclosure. Few Villa Residences. Garden dwellings.^d

This Ward may be divided into two parts, which would be separated by a line drawn through Huntingdon Street, St. Michael Street, and skirting St. Michael's Recreation Ground and St. Mary's Cemetery. On the south-west side of such a line lies the old part of the town, with its narrow, densely-populated streets and back-to-back houses, on the other lies that portion of the Ward that has been built since the passing of the Enclosure Act. In the old part of this Ward is the Union; in the new part, the Coppice Asylum. The temporary Small-pox Hospital was also built on the confines of the Old Town.

BYRON—*Population* (1861), $\left\{ \begin{array}{l} \text{Males, 6,927: Old Town, 8,563.} \\ \text{Females, 8,114: New Town, 6,478.} \end{array} \right.$
14,673. (1871), 15,041.

Number of Inhabited Houses, 3,237.

Character of Houses: Back-to-back. New Enclosure.

Like its neighbour, St. Ann, may be divided into two parts, by a line drawn through Bath Street down to the Southwell Road, but the portion which lies to the east of this road, and which is in the New Enclosure, is of very much smaller extent.

The whole of the district comprised by these two Wards is of good elevation, but differs from the rest of the town in regard to its geological position; all that portion which is situated in the New Enclosure being on the "Clayfield." The stratum which constitutes this is composed of the soft sandstone and marls of the lower

(d) Those which are used as dwellings are situated in "the Gardens" towards the Coppice.

keuper—it is generally known as “skerry”—and is remarkable for the distinctness of its stratification and the consequent facility with which liquids may make their way horizontally between its laminæ.*

It will be understood from the above description of the limits of these Wards that they contain a large area to the north-east (about Blue-bell Hill), which has not yet been built on, and which represents one of the chief growing parts of the Borough.

ST. MARY — *Population* { Males, 3,139.
 (1861), 6,659. (1871), { Females, 3,657.
 6,796.

Number of Inhabited Houses, 1,552.

Character of Houses: Chiefly Back-to-back.

The inhabited portion of this district is situated entirely in the Old Town. It extends, it is true, down to the river Trent, but none of the lower portion is built on, the premises of the Great Northern Railway occupying part of it, and the rest, which is known as the Eastcroft, consisting of cultivated meadows belonging to the Corporation. It consists wholly, then, of the Old Town, and the great majority of its inhabited houses resemble those found in the original parts of Byron and St. Ann's Wards.

EXCHANGE—*Population* { Males, 5,699: Old Town, 5,621.
 (1861), 8,964. (1871), { Females, 5,969: New Town, 6,047.
 11,668.

Number of Inhabited Houses, 2,268.

(e) It will be remembered that, until lately, water from surface wells situate in this stratum, and in dangerous proximity to the Middens, was used for drinking purposes. At my suggestion you directed their use to be discontinued.

CASTLE — Population { Males, 3,519: Old Town, 6,322.
 (1861), 6,823. (1871), { Females, 4,236: New Town, 1,433.
 7,755.

Number of Inhabited Houses, 1,730.

Character of Houses in both Wards: Back-to-back. New Enclosure Houses (200 of which below flood level). Few Villa Residences.

These two Wards together occupy the southern portion of the town, commencing at the Market Place and extending about as far as the Midland Railway Line. Canal Street, which runs due east and west, may be looked upon as the boundary line, separating the original parts of the Wards from their newer divisions on the south, which are situated in the district known as "the Meadows."

It has been stated above that "the Meadows," in the alluvial bed of the Trent, formed the southern boundary of the town. Nearly the whole of this tract is situated below the flood-level of the river, and is, consequently, during a great part of the year under water. In framing the "New Enclosure Act" this important circumstance was apparently overlooked, and it was omitted to introduce clauses by which it would have been possible to have prevented the building of houses below the level of the flood. As a result of this a large number of buildings have been erected, the basement stories of which are, during a great part of the year, positively inundated, and their inhabitants are not only liable to the immense inconvenience which a flood gives rise to, but are living on a soil, which, from being but slightly above the ordinary Trent level, is in a constant state of saturation.

As the outlying part of St. Ann's Ward represents the growth of Nottingham on the east, so it is in the direction of "the Meadows" that its increase takes place on the south. Its vicinity to the river and the Clifton Collieries will probably render the neighbourhood ere long a very populous one. But if the rapidity of its growth is to remain unchecked, it will be imperative that such regulations be made as will ensure every house being above the flood level; in no other way will it be possible to provide for the health and comfort of the inhabitants.

PARK—*Population* (1861), { Males, 2,127: Old part, 4,323.
 5,023. (1871), 5,102. { Females, 2,975: New part,^f 779.

Number of Inhabited Houses, 1,061.

Character of Houses: Villa Residences and Back-to-back.

This Ward, though entirely situate in the original Town, is capable of a natural division into two parts. The one consisting of fine broad streets, lined with houses of a very superior class, lies to the west of Park Row; the other (with which also must be included that small portion of the Ward which lies to the north side of the Derby Road), lying to the east of Park Row, includes buildings very much of the same description as those in the rest of the Old Town.

SEWERAGE.

The town is well off in this respect. The sewers are of good construction, and are now adequately ventilated. There are, however, a considerable number of streets that still remain unsewered. The houses that are situated in "the Meadows," below the level of the flood, cannot of course be said to be properly sewered; in fact, in winter time, when the river overflows its banks, and the sewage necessarily gets backed up the sewers, the basement stories of these houses become actually filled with drainage.

(^f) Includes Wellington Circus, Oxford and Regent Streets.

CHAPTER II.

WATER SUPPLY.

The drinking water of the town is supplied chiefly by the Nottingham Water Works Company. There is also a second source of supply from wells, public and private, sunk in the Sandstone Rock. In addition, there exists a third, though limited supply, from surface wells in "the Meadows," and in the neighbourhood of St. Ann's Well Road. This latter, however, which has been proved to be impure and liable to contamination, you have directed to be disused.

By far the most important source is from the Nottingham Water Works Company. Feeling that it was my duty, as Officer of Health, to investigate the conditions of the water supply of this town, I requested permission of the authorities to be allowed to do so. This, however, has been refused to me. I must, therefore, confine myself to stating the facts relative to the supply that have been elicited at various times. They are given by Dr. Thorne in his Reports on Nottingham^g and Radford^h respectively, on both of which occasions he was unable to obtain access to the Company's reservoirs.

The four sources of supply are—

1. The Bagthorpe Well.
2. The Sion Hill Well.
3. Scottholme Springs in the Valley of the Leen.
4. The Reservoir in the Gravel of the Trent Bed.

(g) Report to Local Government Board on the Prevalence of Infectious Diseases in Nottingham.

(h) Report to Privy Council on the Prevalence of Typhoid Fever in the Parish of Radford.

1. Bagthorpe Well: 2,500,000 gallons.

Sunk in the Bunter Beds of the New Red Sandstone. Water very highly spoken of by all who are acquainted with it.

ANALYSES.

A.—*Analysis of the Bagthorpe Well Water, by Dr. Frankland, F.R.S.*

Per 100,000.

Total solid impurity	24·8
Organic carbon	·026
Organic nitrogen	·019
Ammonia.....	·000
Nitrogen, as nitrates and nitrites.....	·770
Total combined nitrogen	·789
Previous sewage contamination	·7380
Chlorine	1·8
Hardness (temporary)	10·4
„ (permanent)	11·0
„ (total).....	21·4
Appearance	Clear.

November, 1871.

B.—*Analysis of the Bagthorpe Well Water, from Cottages on Mapperley Hills, by Dr. Alfred Hill.*

Per 100,000.

Total solid impurity	24·10
Organic carbon	·057
Organic nitrogen	·009
Ammonia	·002
Nitrogen, as nitrates and nitrites.....	·000
Total combined nitrogen	·01
Previous sewage contamination	·000
Chlorine	3·43
Hardness (temporary)	1·2
„ (permanent)	14·8
„ (total).....	16·0
Appearance	Clear.

November, 1871.

2. *Sion Hill Well*.—900,000 gallons. Well sunk in the Bunter beds of the new Red Sandstone.

“The water flows through the new Red Sandstone, the surface of which is not only densely-populated, but is covered by privy middens, and filth accumulations. But a far more extensive source of pollution has been made out. Before Mr. Fisher’s, and the Sion Hill Wells were sunk, numerous private Wells existed in New Radford, and when these became dry, it was supposed that they were entirely drained; but recent investigations have proved that into some of them, sewage has been turned from various premises. Of thirteen Wells discovered by the Sewer Authority up to the present date, three in various parts of Radford have been turned into Reservoirs for sewage, and one of these latter is situated within little more than 500 feet of Mr. Fisher’s Well. The new Red Sandstone in the locality is of the Bunter variety, and in addition to its extreme porosity, it is known to exhibit numerous and irregular clefts, at times so extensive as to merit the name of “Reservoirs;” these not only, to some extent, divert the natural flow of the springs, but they tend to favour the accumulation of sewage from any sewer Well in their vicinity, and to pollute the water derived from this stratum.

“This Well (Sion Hill) is situated within 800 feet of Mr. Fisher’s Well, and within rather more 1000 feet of the sewer Well before referred to, and somewhat to the south-east of both. In opposition to the view that the Sion Hill Well might have received some of the sewage from this Well, and thus, to some extent, borne its part in contributing to the Epidemic, it is asserted that the springs flow through the Sandstone in a direction from north-east to south-west. But the same remark applies to Mr. Fisher’s Well, though, perhaps, to a somewhat less degree, because of its greater proximity to the contaminating source; and it seems very evident that the argument is not of the value with which it is credited, because, when the Sion Hill Well and Mr. Fisher’s Well were deepened, the private Wells to the north-west of them, that is to say, in the direction of the sewer Well, became dry. *It should also be remembered, that although only three of these sewer Wells have been discovered, it is not yet possible to state that others do not exist.*”—*Dr. Thorne’s Report to Privy Council, on outbreak of Typhoid at Radford, 1870.*

“Speaking of this water, in 1869, before a Select Committee of the House of Commons, Mr. T. Hawksley, C.E., Engineer to the Company, in referring to the changes it had undergone in recent years, stated, that the works from which it is procured had become all but enclosed by the town extensions, that its hardness had gradually increased, that it contained $31\frac{1}{2}$ grains of solid matter in the gallon, and that in his opinion, well water ‘obtained near Nottingham, was not only unsuitable for domestic supply, but totally unsuitable.’”

On the same occasion, Professor Odling, F.R.S., gave evidence to show that the quantity of solid matter per gallon, had within recent years increased from 27·10 grains to 31·57 grains.

C.—*Analysis of Water from Sion Hill Well.*

There is neither lead nor iron ; no sulphuretted hydrogen ; no nitrites.

Per 100,000.	1st Analysis.	2nd Analysis.	Mean.
Total solids	58·0	55·6	56·8
Organic carbon	·61512	·5482	·58166
Organic nitrogen	·0881	·0842	·0861
Ammonia	A trace	·000	..
Nitrogenous nitrates	1·427	1·599	1·513
Total nitrogen	1·5151	1·6832	1·599
Previous sewage contamination	13950	15670	14810
Chlorine	4·6	4·6	4·6
Hardness (removable)	12	12	12
„ (permanent)	22	22	22
„ (total)	34	34	34

The water is bad ; there is a great amount of organic matter and of chlorides, showing the presence of liquid manure. The amount of oxidized organic matter is also large.” Subjoined are “the results of my analysis of Mr. Fisher’s water.” It will be seen that the waters are much alike ; that of Mr. Fisher’s having less organic carbon, but more nitrogen as nitrates.

(Signed) EDGAR B. TRUMAN, M.D.,

November 16, 1870.

Analyst to the Borough of Nottingham.

3. *Scottholme Springs*.—At Scottholme, near Basford, there are works, consisting of a Reservoir and certain Basins, into which springs issue naturally from the sandstone rock immediately on the margin of the river Leen.

In his evidence before the Select Committee, in 1869, Mr. Hawksley describes the Leen “as being exceedingly fouled by bleach works ;” as being “thick with soap and bleach-work chemicals ;” as smelling strongly of chlorides, and as being, at the point where it passes the Company’s Works, “one mass of bleach-work refuse.” He then states that the river affects the springs by percolation, in proof of which he alleges that the chlorine, which thus becomes mixed with the water, has been tasted after it has reached Nottingham, and he expresses the opinion that it would certainly be “advisable to disuse the water.”

Dr. Letheby on the same occasion gave evidence in support of these views ; and he added that, in his judgment, “as an Officer of Health, these springs were dangerous.”

4. *Trent Reservoir Water.*—This water, which is believed to be essentially derived from the river by percolation, is conducted into a Reservoir situated about 120 feet from the river's edge, by means of brick conduits which branch out from it into the gravel; the water level in the Reservoir always corresponding to that of the river. It is probably seriously polluted, and is stated to be exceedingly variable in its quality, as might have been expected from consideration of the source from which it is derived.

Dr. Thorne, in the above-mentioned report on Nottingham, calls attention to the fact that the Trent river, as it passes Nottingham, contains the sewage of the Pottery Towns and Birmingham, Burton-on-Trent, and by the Derwent that of Derby, and by the Soar that of Loughborough and the effluent water from the Sewerage Works at Leicester. Nearer home, by means of small streams, ditches and dykes, that of Beeston, Chilwell, Clifton, Attenborough, Barton, and Lenton. After referring to the conclusion arrived at by the Rivers Pollution Commissioners, to the effect that "there is no river in the United Kingdom long enough to effect the destruction of Sewage by oxidation," he quotes from the evidence given before a Committee of the House of Commons in 1869, the opinion of Professor Ansted, that it would be undesirable "under any circumstances to take the Trent Water for the supply of the town;" and also the statement of Mr. Hawksley, the Engineer to the Company, "that the water was constantly getting worse, that it contained $49\frac{3}{4}$ grs. of solid matter in the gallon, of which $20\frac{1}{2}$ grs. consisted of chloride of sodium, which came "from somewhere in the great gravel bed which underlies the whole of the Nottingham Meadows." He subsequently adds:—

"But the contents of the Trent Reservoir must, in my opinion, be subject to an additional pollution from the Meadows. Not many years ago there were whole streets on the Meadows without sewers, and almost all the houses were without adequate drainage; many, indeed, were either undrained or had drains terminating in a garden or yard cesspool, which, overflowing, frequently covered the surface with its contents, or oozed into a neighbouring ditch, cellar, or well. Undrained privies and open middens were built on the porous gravel, and many of them still remain to pollute the soil and to foul the water with which the gravel abounds. These meadows have, as already stated, been up to the present date

constantly subject to the influence of floods which have swept over the broad alluvial valley on the northern side of the river; the houses have been flooded, the contents of privies and middens have been washed over the yards and gardens, and, as the water has subsided, they have soaked into the soil. The Trent Reservoir lies in this same gravel-bed, and is situated between the inhabited portion of the Meadows and the river; hence the flood water, with its contained filth, has, during the periods of subsidence, flowed towards it, and indeed through it, on its way to the natural river bed. But the pollution of this Reservoir, in the manner indicated, is not only of an occasional and exceptional character. The Trent is constantly varying in height; the low summer level at the Trent Bridge is 65 feet 8 inches above the mean or half-tide level at Hull, that during ordinary high floods is 75 feet 8 inches, the extreme range between low summer water and the highest flood being about 14 feet. When the water is high in the river it is also high in the gravel of the Meadows, and it then freely takes up the filth which still so abundantly fouls that bed. As it subsides, the water which has become fouled passes through and into the Reservoir on its way to the river, and so the Reservoir Water is in constant danger of pollution."

Report on a sample of water taken from the water-main at the "Town Arms" Inn, Trent Bridge, Nottingham:—

"The water is rather hard but is tasteless, inodorous, and almost colourless. It contains only a small amount of ammonia and organic nitrogen, and is almost free from nitric acid. The amount of chlorine present is, however, extremely high for a water beyond the influence of the tide. This circumstance is suggestive either, 1° of contamination with sewage, or 2° of the entrance of some manufacturing refuse, rich in chlorides, into the water source.

"Having regard to the presence of phosphoric acid, and to the small amount of organic matter in the specimen, it is probable that the chlorine is not derived from one of these sources only, but in part from each of them."

The Analytical Details are given in the Table annexed.

Appearance	Bright.
Colour	Faintly greenish, almost colourless.
Deposit	Minute trace.
Taste	Tasteless.
Smell	Inodorous.
Hardness, on Clark's scale	25.
Hardness, after boiling	10.5
Nitrous acid	None.

	Grains per Gallon.
Oxygen absorbed from permanganate	0·028
Total solid contents.....	46·34
Consisting of { Volatile and combustible matter	5·61
{ Fixed salts	40·73
Chlorine	9·06
Nitric acid	Slight traces.
Nitrogen in ammonia.....	0·0031
Organic nitrogen	0·0061

(Signed) A. DUPRÉ.

Westminster Hospital, January 3, 1872.

It would appear, therefore, abundantly evident, from the facts, as above stated, and from the opinions of these authorities, that the supply from two of the sources, viz., Sion Hill and Scottholme Springs (amounting together to about 1,300,000 gallons, or about one-third of the whole supplied by the Company), is not fit for use. It becomes, then, a matter of supreme interest to the inhabitants of Nottingham to know what their exact source of supply is: whether they are drinking the pure water of Bagthorpe, or the contaminated liquid from the Scottholme or Sion Hill Wells. On these points it is impossible for me to enlighten them, as the distribution of the water is a secret, apparently, known to none but the Company's engineer. The probabilities are that a few people, occupying a limited area to the extreme north of the Borough, are fortunate enough to obtain their supply direct from the Bagthorpe Pumping Station, and that the people in the northern part of the town drink the water that has been collected in the Bellevue Reservoir, and which consists of Sion Hill, diluted with Bagthorpe Water; and that those who occupy the southern part of the town drink the water collected in the Park Row Reservoir, which contains water from the Scottholme Springs, with a variable proportion of that from the other sources; and that some are drinking pure, or rather *unmixed* Scottholme Spring Water.

I need hardly say that such a condition of things is extremely unsatisfactory. Of course, the main supply being from the Bagthorpe Well, the greater number of the people in Nottingham are drinking a pure water; but, for all I know to the contrary, a

considerable proportion of the inhabitants may be supplied with the Scottholme Spring, Sion Hill, or Trent water, in an undiluted state; and the otherwise pure water from Bagthorpe may, in other cases, be tainted from these latter sources. When I mention that, during the short time I have been here, about 20 cases of typhoid fever have come under my notice, and that, in at least half these, I have had reason to suspect that the disease originated in drinking impure water, it will be evident to you that the Water Company should be required to do one of two things—either to abandon entirely the three above-mentioned sources of supply, or at least to furnish such information as would render it possible to obviate the risk of dangerous consequences.

It has been mentioned that another source of supply is derived from Wells, public and private, in the town, sunk in the Sandstone rock. The risks of contamination to which the water of these sources is liable are manifold. For not only, on the one hand, is it exposed to the dangers of pollution from the contents of middens and surface refuse which gradually soak into the soil, or is conducted more rapidly along the fissures naturally existing throughout the stratum; but there is also the more formidable danger from sewage wells, similar to those which have been described as existing at Radford, in immediate proximity to the Sion Hill source, the contents of which may at any time be washed into the drinking water. In addition to the natural facilities that exist in this stratum for the passage of impurities, by means of fissures and reservoirs, there is, as Mr. Tarbotton has pointed out to me a further reason why the security of their supply (at least in the case of the more superficial wells) should be impaired. In the process of laying down sewers, gas pipes, &c., the rock composing this stratum has been so thoroughly broken up as to be rendered far more permeable than in its natural state; and it is thus easy to explain how the contents of a leaking midden might find an almost uninterrupted route to the drinking water, and, should a sewer at any time become pervious, its contents would rapidly make their way in the same direction.

I have quite recently had my attention very forcibly called to the

chances of contamination that exist in the case of these wells. On Friday, July 4th, a sample of water was brought from the Exchange Pump (a supply that had been already condemned). It was evidently nothing more nor less than Sewage diluted. In this particular case it was easy to trace the cause of the impurity. The night previously (July 3) had been remarkable for a most unusually heavy fall of rain, and there can be little doubt that in its passage through the clefts and fissures, natural and artificial, existing in the rock, it had swept along with it the sewage, accumulated either superficially in the Middens of the neighbourhood, or that which was collected in disused Wells.

The only safe course to adopt with all these Wells is to abandon them entirely as sources of drinking supply. In the peculiar circumstances under which they are placed it would be impossible to ensure them against the chance of pollution.

CHAPTER III.

EXCREMENT DISPOSAL.

UNDER this heading, I propose to speak of the contrivances for the storage, collection, and removal of excrement from the town; it will include a description of Water-closets, Privies and Ashpits, and Tub Closets. I shall also take occasion to point out what defects there exist: 1. In its collection or storage in Ashpits. 2. In its mode of removal.

I purposely avoid entering into the wider question of the best modes of sewage disposal (using the term in its wider signification, and meaning not only the process of removal, but its final application to the soil), inasmuch as it has other aspects besides the sanitary one, and is consequently not one that I should be competent to deal with alone. In speaking, therefore, of any arrangement in terms of praise or otherwise, I must be understood as looking upon it from a sanitary point of view as effective, or the contrary.

(A.)—First as to Collection.

The methods in use in the town are—1. Water-closets. 2. Privies and Ashpits. 3. Tubs.

I.—Water-Closets.

The numbers existing in the parts of the town occupied by the working classes are so few, that it would be impossible to draw any inferences from their condition. With regard to this contrivance, I am quite satisfied that Water-closets, in the ordinary sense of the term, that is, where their mode of action is not independent of the people making use of them, are not adapted for general use among the working classes. Mr. Richards, who is able to speak with authority on this subject, has, I believe, often expressed the same opinion. It will be understood that I am in no way at present alluding to such arrangements as the Trough Closet in use in Liverpool, or the Tumbler Closet of Leeds.

II.—*Privies and Ashpits.*

These are of various kinds, varying, on the one hand, from the "Wet Middens," which, from structural defects, have become loathsome nuisances, prejudicial to the health not only of the men employed to empty them, but of the inhabitants of the neighbourhood, to those structures, on the other hand, which are in many ways well adapted to serve the purposes for which they are intended.

I have for convenience divided them into three classes.

(i) Those which do not meet the first requirement of the system—viz., dryness.

(ii) Tunnels.

(iii) Those meeting the chief requirements.

(i) The first of these classes is capable of sub-division into

(a) Those below the flood level.

(b) Those that are uncovered and consequently admit the rain. The drainage of the yards also being often so arranged as to run into the pit.

(a) They number in all 204 Privies (with generally an Ashpit to two Privies). It is needless for me to dilate on their condition. I saw them in March when they contained a large quantity of water; while in flood times, they are of course cut off altogether from the dwelling-houses, and the water not only swamps the Ashpit, but invades the Privy also. The effect of moisture on a mixture of ashes and night soil, is to convert it into a nuisance; the ashpit and tub systems alike depending for their efficacy on their dryness. It follows, therefore, that in proportion as this system is departed from in its entirety, and the pit in which the ashes and soil are collected admits water, so far does what would otherwise be inoffensive tend to become a nuisance, and prejudicial to health, not only by the harmful exhalations from the pit, but by the soakage of the soil with decomposing organic matter. In the case of these pits in the Meadows, the requisite conditions are ignored in the grossest possible manner, and they ought all to be condemned on Sanitary grounds.

(b) The same remarks that I have made with regard to the last class are applicable in the case of these, though to a lesser degree. In wet weather they too become swamped, and there is at all times

a large excess of moisture contained in the pits. The chief reason that makes both this and the former kind highly objectionable is, that the night-soil men have very great difficulty in emptying them, and the noxious effluvium, stirred up in the process, is such as occasionally to prostrate them with sickness. On these grounds alone it is imperative that an alteration should be made.

(ii) This class of Midden, which is a most intolerable nuisance, may be best described as consisting of a long narrow vault, open at one extremity, but covered for the rest of its length by the Privies—the open end used for the ashes, and, all along the vault, corresponding with the Privies' communication, lies the soil—so that in these cases efficient mixture is out of the question, and, as may be easily conceived, the task of clearing-out the accumulation is by no means an enviable one for the scavenger.

(iii.) The third class may be divided into

(a) Those in which the chief necessary conditions are fulfilled—where the constructions are water-tight, and of reasonable size; where, also, there is a tolerably efficient mixture of ashes and excrement.

(b) Privies built on an approved plan, figured in your Report of 1868. They provide for the efficient mixing of ashes and soil, they are of such form and such materials as to render soakage impossible, and they are, in addition, well ventilated. With these requisites they combine the immense advantage of presenting means of accommodation in a compact form. Instead of every little yard in the New Enclosure being garnished with the unsightly appendage of an Ashpit, which, in many cases, serve materially to impede the current of fresh air, one of these blocks, erected at either end of the row, would allow at once of the free passage of air, and would, at the same time, present an appearance by no means ungainly.

III.—*Tubs.*

This, as carried out in Nottingham, is a modification^t of what is generally known as the "Rochdale System."

The dejections are collected in movable receptacles (made of

(i) I understand from those who are acquainted with the system, as carried on at Rochdale, that the mode of conducting it here is in some material respects different.

paraffin casks cut in half, and fitted with iron handles), placed beneath the closet seat. Before using them, the bottom of the cask is sprinkled with a small quantity of street-sweepings, which serve as an absorbent material. The tub, properly speaking, is a receptacle for dejections only, and a certain amount of *fine ash*; all house-slops, including the greater part of the urine, going down the drains, and the coarser ashes being kept separate. Frequency of removal is one of the essentials of this system, and arrangements are made whereby they are removed twice or thrice a week, or even daily, according to the requirements of the case. Before the full pails are carted away, they are fitted with lids having India-rubber packing attached to the flange. Thus covered, they are placed on a van, and, protected by a large oil-cloth, are then removed to the *dépôt*.

I have inquired carefully into the condition of these closets, with the view of ascertaining whether there arises any nuisance from them. From the statements of householders to whose residences pail-closets are attached, I have ascertained that the removal of the filled pails gives rise to very little offence. In a small proportion the requirements of the system had not been met; these were sloppy from the admixture of house-water, and, consequently, more or less offensive. It has been stated to me, on one or two occasions, that foul odours come from the pail vans at times, in the summer, when passing through the streets. Assuming that this was so, I do not believe that it is for a moment contended that the offensiveness at all equals that arising from carts laden with the contents of ordinary middens. It appears, then, that this system of excrement removal, when efficiently carried out, so as to ensure, 1, frequency of removal; 2, adequate screening of the dejections by fine ash or street-sweepings; 3, efficient covering of the vessels in removing, is free from nuisance; but that, in order to carry out these requirements, it is necessary that, in every house where the pail system is introduced, there shall be sufficient drainage for carrying away all house-slops,^k and that there shall be a separate receptacle for all solid refuse, including the coarser ashes, inasmuch as the wholesale admixture of ashes with excrement, which is in

(k) This term is not meant necessarily to include the urine.

no way necessary on sanitary grounds, must materially decrease its manurial value. I may mention, as another and no less important requisite, that all parties using them shall have clear and definite instructions to guide them in their use, and effect should be given to them by vigilant inspection.

(B.)—*Removal of Night-Soil and Refuse.*¹

This most important branch of Municipal administration was formerly intrusted to contractors, but is now carried on by a staff of men in your employ.

The contents of the ashpits and tub-closets are taken down to the wharf. This wharf, which is in a very clean condition, is situated in a tolerably thickly inhabited part of the town, but the arrangements that exist for the rapid conveyance of the soil, by means of the canal, appear to be very perfect, as, from what I can ascertain, there is little or no avoidable nuisance.

My experience of the working of this department has led me to believe that it is in some respects defective. In the first place, I cannot help thinking that the whole management of this department, including the collection and disposal of refuse, should be under the control of one responsible man. This appears to me

(1) *Removal of Contents of Ashpits.*—The number of men employed in the emptying of the Ashpits is 48. They are divided into twelve sets of four each. For the use of each set there are two carts and one horse. One man in each set is responsible for the work, and he is provided with a list (in excess of the work to be done) of the Ashpits to be emptied. The arrangements are such as to provide the men and horses being kept constantly at work. The night's work lasts from 10 p.m. to 7 a.m., at which time the head of the gang gives an account of the work done. There is no system by which the Ashpits in a certain district are emptied at the same time, and the labour of the men thus economized. The carts, when full, are driven down to the wharf mentioned above, which is situated on the Leen Canal, near the east end of Canal Street; arrived here, it is shot into a boat which lies along side of the wharf. This boat is manned by three men, who are called trimmers, whose duty it is to pick out any debris, such as broken pots, &c., that there may have been in the contents of the Ashpit. As soon as the boat is laden it is started off down the Canal. The nature of the loads brought down to the wharf by the night-soil men is inspected by Robinson, who also superintends the trimmers at their work.

most desirable, for two reasons: the first, and by far the most important, being that the health and comfort of a large section of the community depends in great measure on the efficient administration of this department: and, secondly, I consider that the control of a large sum, such as that which represents annually the income and expenditure of this department, would be far more advantageously placed in the hands of one man, possessed at the same time of knowledge of the work and good business habits, than left as it is now. I would venture, also, to suggest that there should be a sub-committee appointed, to whom the head of the night-soil department would be directly responsible, and to whom representations might be made where nuisances occur from faults of the staff. It would also be advisable that there should be submitted to the consideration of this committee certain questions of importance relating to the collection and disposal of the excrement of the town.

Mr. Richards, who goes to the wharf every morning, looks specially to the stable department. He gives the necessary orders for the day. He supervises the work of Robinson, and he receives the reports of the night-soil men as to defective pits.

Lowe, whose duties appear to be connected chiefly with the selling of the night-soil, is said to be the responsible man. He manages the horses and plant and hires the men, but, when difficulties arise in the working of any section of the department, he always has Mr. Richards to apply to.

Chetwin, who is also a member of the staff, is sent to inquire into matters reported by the night-soil men, and to look generally after the efficiency of their work.

All applications for the emptying of pits are received at the Municipal Offices, and at the end of the day are entered into the book by the clerk of the department.

Removal of Tubs.—The method adopted for the removal of the tubs is as follows: The staff consists of ten men, who have the use of five horses and drays. Two men start off in a dray laden with twenty empty tubs; their work commences at 3 o'clock in the summer and 5 o'clock in the winter. The town is divided into five blocks, so that the time of the men is economized, each set having a block allotted to it. They are provided also with a book, showing what Tubs want changing each day, and in the course of about six journeys they are able to complete the work.

Owing to the defective room at the wharf it has been necessary to empty the contents of the Tubs into the same boat as serves for the Ashpit manure.

CHAPTER IV.

SOCIAL PECULIARITIES WHICH HAVE A DIRECT BEARING ON THE
QUESTION OF PUBLIC HEALTH. HOUSE ACCOMMODATION.
OVER-CROWDING. COMMON LODGING HOUSES.

IN all our large textile manufacturing towns there exists a rate of mortality very much above the healthy standard. This is capable of explanation in two ways. In the first place, there is the direct influence of the more or less unhealthy occupation on the operatives themselves; and, in the second place, there is an indirect influence brought about by the employment of married women, whereby an increased number of deaths occurs among infants, who are, in consequence, to a large extent deprived of maternal care. Nottingham, however, cannot with fairness be compared with any of the so-called textile manufacturing towns; or, speaking generally, with any other factory town at all. The conditions that exist here, are quite without parallel elsewhere. In the first place, the employment of married women is carried on to a far less extent than it is in the cotton, silk, woollen, or worsted towns. A great deal of the work, too, undertaken by this class, can be carried on at their own homes, and partakes more of the nature of a domestic employment than that which is known as factory labour. Only a small proportion, then, of the number of deaths that occur among infants is fairly attributable to the employment of married women in factory work. Moreover, in taking into account the tendency that this would have to increase the general mortality, it must not be omitted to mention that there exists one of an opposite character, in a social peculiarity which, though it exists alike in all factory towns, is here present in greater force than elsewhere. I allude to the large importation of adult life that takes place in these towns, which are being constantly fed by the immigration, from rural districts, of able-bodied men and women, mostly in the prime of life, who are in search of employment. Some idea may be gained

of its extent, and of its consequent importance, in estimating the different causes of mortality, by noting the fact that, in this town, at the last census, out of the 90,000 inhabitants, there were no less than 8,000 more females than males." The full significance of this fact is evident when it is borne in mind that this great disproportion is due to the number of girls resident in the town, brought here by the nature of the trade. Among these, it must be remembered, the rate of mortality would naturally be low, more so, even, than among adult men. In addition to this, it is important to bear in mind, that the greater number of these girls are not of the class known as "mill-hands," but that they are *employés* in warehouses, where they are placed in conditions which, hygienically, are as favourable as those of domestic servants.

I may here take occasion to notice a condition of things that rises out of the above-mentioned social peculiarity. The natural result of a large number of girls being turned adrift at an age when they are most in need of guidance, and who are, at the same time, deprived of home comforts and attractions, is by throwing them very much on their own resources, thereby to produce a certain laxity of morals. The effect of this on the public health may be easily understood, and of its serious nature I have little doubt, from what I learn from those of my professional brethren who are connected with the public medical institutions of the town. I believe that the best remedy for this state of things is, by substituting, as far as possible, home comforts and amusements, to hold out inducements of superior force; and I should be neglecting my duty if I failed to mention, in the highest terms of praise, the meritorious efforts which have been made by some benevolent people to effect this, by the institution of places known as "Working Girls' Homes." The chief objects of these Homes—which, as put forth in the Report of the Committee, are "to afford shelter and protection to young women who are brought into this

(*m*) There is, normally, existing throughout England, a slight excess in the number of females over that of males, but it is nothing approaching to the large disproportion here noted.

town by the exigencies of trade, and exposed, without a friend, to the temptations and snares of town life; and, also, as an educational centre, from whence may spring better ideas of the proper management of a working man's home"—are such as cannot fail to meet with the cordial support they deserve.

Another peculiarity in its social life, which Nottingham shares with other textile manufacturing towns, consists in the very high value of labour, which renders the working classes, comparatively speaking, wealthy. This is a circumstance which, from its direct bearing upon the health of the people, deserves the most prominent notice. It will be evident that the amount of poverty existing in a community, inasmuch as it implies a proportionate number of scantily-nourished individuals, stands in direct relation with the amount of disease; and, that, where it is diminished, and the population becomes proportionately a "well-fed" one, its power of resisting disease is correspondingly increased. There is, also, another way in which poverty tends to influence the amount of disease. One of the great bars to the carrying out of Sanitary work, and the enforcement of Sanitary law, in some towns, and in certain parts of London, consists in the poorness of the people. It is a difficult matter to enforce the maintenance of such an amount of cleanliness and repair, as are requisite on Sanitary principles, in habitations where the tenants are barely possessed of the means of subsistence. The case, however, is very different in Nottingham, where, owing to the high rate of wages, it would be quite easy for a man to maintain a moderate family in very decent circumstances on the proceeds of his own labour; and, if the additional earnings of his wife, and such of his children as are old enough for employment, were added, the total would be very much in excess of that which it would be possible for an artisan to earn in a non-factory town. With such means for affording proper house accommodation, it is surely no hardship to require that it should be of such nature as to conform with, at least, the most essential of Sanitary requirements. Where, for instance, a man is found living with his wife and two children (whose aggregate earnings amount to £3 a-week), in a couple of small rooms, badly ventilated, with walls in such a state as to harbour filth and disease, with floors and ceilings

dilapidated, it is only right that the Sanitary law should be carried out, and that the public health should not be sacrificed to a small pecuniary saving. This argument gains additional strength when it is reflected that the money so saved is, when the first opportunity offers, squandered in drunkenness and debauchery.

These remarks lead me to speak of the comparative densities of population, and the class of house accommodation in the different parts of the town; and, in order to save repetition, I will consider them together.

House Accommodation and Over-crowding.

I have already described how there is a natural division of the town into two parts, the old and the new; the former consisting of the original town, with the Market Place as its centre, and the latter of two portions separated by the parish of Sneinton; a north-eastern, comprising the greater part of Sherwood Ward; and a southern, comprising those large portions of the Castle and Exchange Wards that are situated in the Meadows. It will be convenient, now, to consider these two component parts of Nottingham, separately in regard to their house accommodation.

Much has been done, I understand, of late years, to improve the Sanitary condition of the old town, not only in the sewerage and paving of its filthy courts, but in the pulling down of houses which obstructed the admission of light and air. That much, however, still remains to be done, may be judged of by the fact that there still exist as many as 8000 "back-to-back" houses, a great number of which are situated in narrow, unventilated courts and alleys. All "back-to-back" houses are, from a Sanitary point of view, to be most strongly condemned; their construction is such as to render the free circulation of air impossible. Where through ventilation cannot be secured, as is the case in these dwellings, the air in rooms remains to a great extent stagnant and unchanged. The means ordinarily existing in such rooms (doors, chimney shafts, and windows), being quite inadequate for the proper purification of the contaminated atmosphere. But not only are these dwellings most unfavourably placed with regard to the passage of a through current of air, but the natural means for ventilation that exist in well-constructed

houses, are here unequal to the task. In upwards of 200 of them, the conditions of which I have examined, nearly half had staircases so narrow, dark, and tortuous, that it would be physically impossible for them to admit the upward or downward passage of air in any material quantity; almost all the rooms are provided with that kind of window known as the Yorkshire light, which opens on hinges, and is perhaps less easily adapted to the purposes of ventilation than others; in addition to this, a considerable number of them were without fireplaces, and in these there was no provision made to compensate for the absence. Rooms of such a description, where the pure air seems to be carefully excluded in every possible way, when tenanted for a few hours, become intolerably close and hot, and it is important to bear this fact in mind in connection with the question of overcrowding, inasmuch as it explains how a room of cubical contents—say of about 1200 feet, if adequately ventilated, would serve for the accommodation of a couple of grown-up persons and two children; when, if placed in circumstances similar to those which have been described above, it ought to be looked on as incapable of affording half the accommodation without giving rise to conditions which are in many ways prejudicial to health.

But there are other Sanitary defects existing in these houses of the Old Town that call for special notice. A certain number of the dwellings that I examined had the walls, floors, and ceilings of the rooms dirty and dilapidated; the walls, which were crumbling away, and everywhere intersected with vermin, had, probably, not been scraped for years; the plaster of the floors was, in places, worn out, so as to form pits of irregular size, and full of dirt; and the number of cobwebs, stretched between the rafters of the ceiling, gave evidence of total neglect with regard to cleanliness. This is the state of things most favourable to the spread of infectious disease. Every gap in the floor where the dirt lodged, every hole that the vermin had made in the walls, might be looked upon as affording a lurking-place for fever poisons. Given the element of contagion, it would be impossible to conceive conditions under which it would spread with greater facility.

To the baneful influence of the above unhealthy condition, was superadded, in some cases, the evil of over-crowding. I have

already said that, in certain instances, owing to structural imperfections, it is necessary to look upon one room as over-crowded, while, in another of equal size, the same number of persons may be harboured without giving rise to injurious effect. In many, however, of these rooms, there were found numbers greatly in excess of such as might be allowable, even under the most favourable circumstances. For example, taking 400 cubic feet⁽¹⁾ as being the standard required by an adult occupying the room during the night and the greater part of the day as well (and this is by no means a liberal allowance), out of the 800 rooms examined, there were upwards of 70 in which the allowance per head was far below the standard, and, in some few cases, the over-crowding became monstrous, the cubic space per head being reckoned at less than 100 cubic feet. But the point to which I wish specially to call attention, in connection with over-crowding, is the very unequal distribution of the inhabitants, not only of the town generally, but of the Old Town. In seeking to apply the remedy to an evil of this nature, it is of great importance to know that it is not necessary. I am desirous, therefore, of noting, with particular emphasis, the fact that out of the number of rooms examined, upwards of 50, which were habitable, were untenanted altogether.

I shall have occasion again to refer to the evil effects of over-crowding in this unventilated portion of the town, and I shall also point out in what way I consider a remedy may be best applied; in the meanwhile, let me remind you that Sanitary work ought to commence at home. The question of the Sanitary state of factories is always one of public interest, and the legislature recognizes the importance of reducing, in every possible way, the unwholesome conditions under which factory labour is carried on; but the employers of that labour have reasonable grounds for complaint, if, after they have taken pains to render their occupations as wholesome as possible, they have no guarantee that the operative, when

(1) This number is mentioned, as being the minimum required by the magistrates in the metropolis; but it may fairly be said that the standard fixed upon in the crowded parts of London is lower than what might reasonably be expected elsewhere; and I am disposed to think that 500 feet cubic is the least that should be required for every adult individual in a town of this description.

his labour is finished, will not be subjected to conditions more deleterious than those existing even in a badly-managed factory, at his own close and dirty home.

Having noticed the faults existing in the dwellings of the Old Town, I now turn to the new part, to see what differences exist between the two, and in what manner the latter has benefited by the sad experience of the former.

I have already, in my introductory remarks, adverted to the nature of the "New Enclosure Act." Those who were in authority at the time, impressed with the desirability of making the future town more healthy than the existing one, introduced clauses which not only provided for every house being adequately ventilated, but further specified particulars as to height, number of rooms, position of privy, &c. Thus, by wording it in such an unfortunate manner as to admit only of the narrowest construction, instead of using general terms, and leaving the direct application to the discretion of future authorities, it has been rendered possible for dwellings to be erected in a manner which, though directly complying with the letter of the law, are built in distinct contravention to its spirit. As a notable instance, on the one hand, of an error of *commission*, I may cite the clause which provides that every house shall contain at least three bedrooms, that is to say, that an artizan who has just married, and is desirous of having a house to himself, must take one with three bedrooms, or have none at all! As might be expected in practice, members of more than one family frequently occupy one house, and thus result all the evils naturally attendant upon people of different families residing in a small house, built without any special provisions for privacy.

On the other hand, an equally remarkable instance of an error of *omission* may be pointed to; there are in the Meadows at the present time, no less than 200 houses with their basement or ground floors below the flood level; that is to say, flooded during a great part of the winter, to an extent varying from two to five feet. In this case, it is true, the authorities probably thought that they had sufficiently provided against this evil, by requiring the front of all the houses to be built on a level with the roads (all roads

having been previously raised above the height that the water attains at flood times), but it was neglected to specify that the back should be the same level as the front ! Unfortunately there have not been found wanting those who were prepared to take advantage of this oversight, and in consequence houses have been built, the first floors of which facing to the front, are on the proper level, while the ground floor, which opens to the back, is several feet below.

With regard to the Sanitary condition of the houses in the New Enclosure* (with the exception of those situated below the flood level), they are of course vastly superior to those of the Old Town, though their plan of construction is not such as to meet the requirements of a growing town like Nottingham, yet it has at least provided for that most essential of all Sanitary requirements, an abundant supply of pure air.

Common Lodging Houses.

On my taking office here, in the month of March, I made an inspection of these houses, naturally thinking it my duty to commence with those that were registered.

In all big towns there exist institutions which are known under the name of Common Lodging Houses ; establishments where provision is made for the reception, not only of tramps who are passing through the town, but for such of the working classes whose means do not admit of their having lodgings of their own, or whose wants are not sufficient to require them. In the early days of Public Health administration, it was considered of great importance that they should be placed under such control as would, at the same time, provide for all Sanitary requirements, and admit of frequent and regular inspection. To insure this, an Act of Parliament was passed in 1851, known as the Common Lodging Houses Act ; and this, which was further supplemented by another in 1853, constitute the laws under which the management of these institutions is effectively carried out throughout the metropolis,

* I have not considered it necessary to refer specially to those habitations which I have previously spoken of as garden dwellings. They are most of them without the ordinary domestic appliances, and are, so far, unfit for occupation.

and in some large towns. In order, I presume, that houses should not be used for this purpose that were not adapted from their smallness, by one of the clauses in the later Act it was enacted, that no house should be licensed as a Common Lodging House which was rated for the relief of the poor at a sum of less than £10. When a house in the metropolis is about to be licensed for this purpose, it is visited, and the number of persons apportioned to each room, according to a fixed standard, the minimum requirements of each person being taken at 250 cubic feet.^o The ventilation of the rooms is attended to, and they are required to be kept in a necessary state of cleanliness and repair. In fact, the accommodation of these houses is made, at least, to come up to the standard of that in the casual ward of a workhouse; and, for the sum of 3d. a night, it is possible for the vagrant, or for the town resident who prefers this mode of living, to obtain accommodation at least as good as that afforded to paupers. I may add that, for obvious reasons, the inspection of these houses is placed in the hands of the police, whose duty it is simply to see that the laws and regulations are carried out.

I do not propose, now, to trouble you with the details of the Report that I made to you on the condition of these places: suffice it to say that the great majority were in a most filthy and disgusting state. No attempt at separation of the sexes was made, and the number of people allotted to each room bore no sort of relation to the requirements, the overcrowding, in some cases, being such as to be, in the highest degree, dangerous to health: in short, beyond the fact that, nailed up over the door was a blue board purporting that the house was a "Registered Common Lodging House," and that, in a few cases, it was possible to unearth, from under a mass of lumber, a copy of the "Bye Laws and Regulations," which should, properly speaking, have been hung up in a conspicuous place, there was no sign in these houses of the existence of such laws as the Common Lodging Houses Acts.

(*o*) In some cases it is rather less than this. Of course, the cubic space required by people for sleeping accommodation is much less than that which is necessary when the room is inhabited in the day-time, as well as at night.

At my suggestion you have effected considerable improvements in the above conditions. By insisting on the limitation of certain numbers to the several rooms, and, as far as possible, on the classification of the sexes, and, by also requiring that in all cases the ventilation of these rooms shall be attended to, you have greatly lessened their unwholesome state. You have also thought proper to withdraw the license in the case of the worst and smallest houses; and, in one instance, where a fresh application for a license has been made, you have laid down stricter requirements as to the numbers and separation of the sexes, and have endeavoured to promote the use of small iron bedsteads instead of the huge wooden ones, which I invariably found to be in a shockingly filthy state.

The argument which I particularly urged in my Report in favour of these houses being under a system of Sanitary supervision, was founded on the fact that these establishments are always likely to prove foci, or centres of infection, and that it is important here, more so even than in houses which form the fixed habitation of people of the same class, that regulations, with regard to cleanliness and overcrowding, should be strictly attended to; and that, though it might not be practicable in a town like this to carry out fully Sanitary requirements in this respect, yet that it was imperative that an excess of over-crowding in any one spot should be jealously guarded against, and the population apportioned as evenly as possible.

Before leaving the subject of house accommodation, I should like to take the opportunity of bringing before your notice a real difficulty which lies in the way of Sanitary administration. It consists in the need that there is for accommodation, much of the same sort as that which exists in Common Lodging Houses. If suitable dwellings were erected on the site of some of the wretched and dilapidated property that now exists in the Old Town, there might be establishments, on the one hand, where people could be taken in and provided for at so much a week, or, on the other hand, reasonable accommodation might be afforded to couples and small families, similar to that in many of the model establishments in London. It is, undoubtedly, better that each family should have a separate house, but where, as in a big town of this description, this is not possible

in all cases, there can be no better substitute than the arrangement I have indicated.

In order to face this difficulty, in a manner such as to insure its being overcome, it would be of course necessary that a considerable amount of capital should be invested : and, if a scheme were undertaken by private individuals for the building of such dwellings, I have little doubt that it would prove successful as a speculation. But it seems to me that, if such a project were undertaken by a great Corporation like this, it would be possible to do so even with greater economy than could be exercised on the smaller scale ; and that a benefit would be conferred on the public that would be lastingly appreciated.

I take the occasion to add just a few words on the subject of overcrowding. I have already shown that, even with the existing accommodation, the overcrowding in certain parts of the town is by no means a necessity, and that it would be quite possible to abate it by distributing the population more evenly. But what I wish now specially to remark is, that the excuse for overcrowding, founded on the scarcity of house-room, is by no means a valid one. Had it been allowed to hold good in London, the now populous suburbs would have never attained their present magnitude—the metropolis would have never grown, circumferentially, to the extent that it has done ; but, instead, its central parts would have continued to become more and more densely crowded ; the demand for fresh house-accommodation would not have been created, and the supply would, consequently, never have been furnished.

CHAPTER V.

FALSE IMPRESSIONS FOUNDED ON GROSS DEATH-RATES.—COMPARATIVE VIEWS OF MORTALITY IN THE SEVERAL WARDS FOR FOUR YEARS.—INFANTILE MORTALITY IN THE OLD TOWN.—MORTALITY IN FOUR NATURAL AREAS FOR 1872.—CONSUMPTION IN THE OLD TOWN AND THE MEADOWS.—DISTRIBUTION OF ZYMOTIC DISEASES THROUGHOUT THE BOROUGH.

WE now come to consider the evidence furnished by the death register of the prejudicial effects that these conditions have had on the public health. But, before doing so, it would be advisable to make a few remarks on the fallacies attending conclusions drawn on, what may be termed, gross death-rates.

The rough test of the healthiness of the eighteen big towns of England that is generally applied by means of gross death-rates—that is, the rates of mortality calculated on the total number of deaths, from all causes indiscriminately, in the town—represents Nottingham as having an average of 24·9 per 1000 for the last five years. That is to say, that computing the population at 90,000, $90 \times 24\cdot9$, or 2,241 die in the year. This is a rate very much in excess of what may be looked on as the normal standard, and which amounts to 17^p per 1000, but it is also considerably below the rate exhibited by certain other factory towns, such as Leicester (27·3), and Manchester (30·9).

But it is obvious that such returns, though of considerable interest, and, doubtless, valuable in their way, are of themselves not sufficient to form a criterion of the health of any town, and certainly not of such a one as Nottingham. For example, in the case of London is

(p) 17 per 1,000 is the rate of mortality that is looked upon as the healthy standard: that is to say, the natural death-rate throughout England, or the mortality from unavoidable disease.

it not utterly fallacious to take the death-rate of the whole town and hold it up as an index of its healthiness? Is it not clear that its amount is subject to variation from a multitude of conditions, which would have to be duly estimated and taken into consideration before it becomes of real value? While the inhabitants of one part of this vast area are housing in their comfortable mansions numbers of domestic servants, those of another district are living in wretched squalid homes, are breathing impure air, and are exposed to manifold unwholesome influences. In the one part there are collected together a number of people in robust health and in the prime of life; in the other, Sanitary evils are operating upon a population normally constituted. In the former, the death-rate is unnaturally low; in the latter, strikingly high.

The case of London is an exaggerated one. The artificial conditions of existence are here present to a greater extent than in other towns; but the same remarks are applicable, though in a less degree to the eighteen big towns that are weekly compared with it.

In some of these the proportion inhabited by the better classes, who have in their employ domestic servants, is small; in others, great. In one of the former class the death-rate may be low, and in another of the latter class, high; but the amount of preventible disease existing in the two may be identical.

To take another instance, as illustrating more closely the peculiar source of fallacy that exists in this town. How patent would be the absurdity of arguing that Portsmouth was the most healthy of the big towns in the kingdom, from the fact that it weekly presents a death-rate which is generally the lowest of the eighteen. Would it not be obvious rather, that in this case the low rate of mortality is due to the fact that the population consists largely of military and naval men, adults, or mostly in the prime of life, who have all had to pass a medical examination before they are allowed to serve.

That there are special conditions in the social life of Nottingham worthy of consideration in estimating its death-rate, I have endeavoured to show in my last chapter, and to this I must now refer, in order to guard anyone against assuming too much on the scanty data of gross death-rates.

In order, therefore, to make the death returns of use, as a basis for Sanitary administration, it is necessary to estimate from them the relative amounts of disease in different parts of the town. It is also advisable to present a comparative view of the amounts of preventible disease. These processes of sifting I have endeavoured to do in the manner which I will now indicate.

I have constructed for your perusal four tables: in the first I have shown the death-rates in the different wards for a period of four years; in the second, I have demonstrated the same, after making certain necessary corrections; in the third, I have entered into the like details for less arbitrary areas than those included in the wards of the town; and, in the fourth, I have put before you the number of deaths occurring, during the last four years, in different parts of the town, from the several zymotic diseases, or those, the origin, or prevention of spread of which is, in a great measure, within the possibility of control.

In the three first of these I have exhibited, not only the ratio of the whole mortality, but that existing under five and one year of age. The object in so doing is, that a more accurate test of Sanitary conditions may be provided. It is on the lives of infants that unhealthy influences have their deadliest effects. Where the atmosphere they breathe contains a poisonous excess of carbonic acid, they will die of convulsions; where it is laden with the products of decomposing excrement, they will die of diarrhœa. All alike may be exposed to unhealthy conditions, but it is only the weaker ones that will be killed; and the number that die will increase directly with the strength of the noxious influence. But in many of our large manufacturing towns there are other influences at work to curtail the natural period of existence. The employment of married women in factory labour leads to such a neglect of the requirements of infant life, that many are killed off who, if properly nurtured, would have grown up sufficiently strong and hardy. The babe of a mother employed at a factory, whose home is in a crowded neighbourhood, has not only to run the gauntlet of those unwholesome conditions inseparable from its birth-place, but its existence is rendered precarious by a sort of

nursing that, in many cases, proves fatal. In considering, therefore, infant mortality, it is most important to take into account this influence, which is foreign to those which may be strictly termed Sanitary.

In this town, the employment of married women in factory labour is nothing like so extensive as in the cotton districts; and, consequently, arguments founded on the condition of things known to exist there, are not equally applicable here. But, on the other hand, it has been urged, I believe, that the number of illegitimate births in Nottingham is excessive, and that, in these cases, the chances of neglect being greater, the mortality will be higher. It is not my intention to enter fully into a consideration of the causes in operation in producing the high rate of mortality among infants in this town: indeed, within the short limits of this Report, it would be impossible for me to do so. This much, however, I feel in a position to state, that whatever share influences connected with social peculiarities may have, the large proportion of deaths occurring at the early period of childhood is, in very great measure, attributable to the unhealthy conditions existing in some parts of the town.

I am confirmed in this opinion very much by the fact that the high rate of mortality is not confined to infants, but is evident, also, among children below the age of five.

If, in spite of these early perils, the infant survives the first year of its life, it has yet to be subjected to dangers, the magnitude of which will depend on the efficiency of Sanitary administration. The most dreaded of these, Scarlet Fever, is certain to be present, and though there may be freedom from it for a time, yet, where the conditions are favourable to its spread, it is sure, before long, to gather to itself a large number of victims. Measles and Whooping Cough, which are, in like manner, capable of control, will also cause the death of a considerable portion; and where, as in this town, vaccination has not been properly looked after, Small-pox, if it appear in the midst, will unfailingly kill numbers.

The reasons for recording in a separate section the deaths from zymotic diseases will be sufficiently obvious. Of the four years

the statistics of which I tabulate, the first two were remarkable for the prevalence of Scarlet Fever, and the last two for that of Small-pox. All four were notable for the prevalence of Typhoid Fever and Diarrhœa.

The estimation of the amount of Phthisis, or Consumption, in a district is very important as a means of testing its hygienic state. In the obscurity which generally surrounds the early origin of this disease, no prudent physician would think of making a statement that any one condition was the cause of the malady evolved; but there is nothing in the whole science of medicine more clearly established than the dependence of this disease on certain Sanitary defects. One class of these I have described when speaking of the dwellings of the Old Town. The air contained in these rooms, rich in carbonic acid, and reeking with the exhalations from the lungs and skins of other people, is just such as is likely to cause the development, or to urge on the course of this insidious disease. When the seeds of the malady are existent it requires only fostering conditions like these for their growth.

There is another condition which has recently been proved to have a direct connection with the causation of Consumption. The saturation of the soil with moisture, or its *wetness*, has been shown of late years to favour the development of this disease. I must ask you, then, to pay particular attention to the rate of mortality from Phthisis in the different parts of the town. In the first two tables you will be unable to detect the effects of this cause, on account of the arbitrary nature of the areas comprised in the different Wards; but in the third Table I shall be able to show you facts which have a direct bearing on this point.

Table I.—It has already been mentioned that the value of this Table consists in its embracing the statistics for a long period, and, therefore, serving to indicate, with considerable certainty, the existence of certain influences in causing the variation in the rates of mortality.

It is necessary to put in a word of explanation with regard to two of the wards—Park and St. Ann. The position of the General Hospital causes the number of deaths registered in the former

district to be unfairly high; while the Union burdens the latter with a number of deaths that do not, properly speaking, belong to this Ward. In the case of Park, I have deducted in the first section (Deaths at all ages), those deaths occurring in the Hospital but in the remaining sections no correction has been made. This was hardly called for in sections 2 and 3, as the number occurring below five in the Hospital (or Children's Hospital) may be left out of consideration; but it must be borne in mind that, in sections 4 and 5, the rate of mortality in Park is overstated. In St. Ann's, no corrections have been made: the figures, therefore, more especially those in sections 1 and 5, indicate a death-rate higher than what is fairly attributable to this Ward.

The prominent facts to be noted in this Table are, that Sherwood is universally top of the list (having a death-rate below even the normal standard); Byron and St. Mary always have a bad place; while Castle and Exchange occupy an intermediate position. There is some disturbance in this order in the last section, which will be explained more fully subsequently.

It has been shown how the number of deaths registered in Park and St. Ann's Wards are swollen by those occurring in the General Hospital and the Union, which is a pauper hospital. I have felt it most desirable, in stating facts with regard to the healthiness of the different Wards, to reduce the errors arising from these sources to their minimum. Of course, it was out of the question my doing this for the whole of the four years: but for the one year, 1872, it was not impracticable. I have, accordingly, been at some pains to ascertain, how many of the deaths occurring in these institutions belong properly to their respective Wards; how many belong to each of the other Wards; and how many have occurred in imported cases: that is to say, in people who do not, properly speaking, belong to the borough at all. In the case of the first of these institutions it has been possible to apply this correction completely. Through the kindness of the authorities I have been enabled to consult the "Death Register," and to allot each death to its respective district. In the case, however, of the Union, I have not been able to arrive at the desirable amount of accuracy. This is

TABLE I.

Death rates, per 1000 persons, living in the several Wards, for the four years 1869—1872 inclusive.

SECTION 1.—ALL AGES.						
	1869.	1870.	1871.	1872.	AVERAGE.	
Sherwood	15·5	18·3	17·4	16·3	16·8	
Exchange	21·0	19·2	21·4	21·6	20·8	
Castle	20·4	20·8	23·3	21·7	21·5	
Park	23·7	25·7	19·0	19·7	22·0	
Byron	25·6	28·7	26·5	26·7	26·8	
St. Mary	26·9	26·3	31·8	26·8	27·9	
St. Ann	28·8	30·0	28·4	31·0	29·5	
SECTION 2.—UNDER 5 YEARS OF AGE.*						
Sherwood	5·6	5·6	4·8	5·3	5·3	
Park	7·6	5·6	5·8	7·4	6·6	
Exchange	9·7	8·1	10·5	10·0	9·5	
Castle	10·3	8·3	9·9	9·6	9·5	
St. Ann	11·0	10·6	9·6	10·8	10·5	
Byron	11·6	14·2	11·9	13·0	12·6	
St. Mary	12·8	13·7	14·2	15·0	13·9	
SECTION 3.—UNDER ONE YEAR OF AGE.*						
Sherwood	3·6	3·9	3·5	3·9	3·7	
Park	3·9	3·9	2·3	5·1	3·8	
Exchange	5·3	5·1	6·5	7·2	6·0	
Castle	5·6	4·9	7·3	7·3	6·2	
St. Ann	7·3	6·6	6·5	7·8	7·0	
Byron	7·2	8·5	8·0	8·8	8·1	
St. Mary	7·5	7·9	7·9	11·3	8·6	
SECTION 4.—ZYMOTIC DISEASES.						
Sherwood	2·8	3·3	2·7	2·5	2·8	
Exchange	4·0	3·9	4·5	4·7	4·2	
Castle	4·6	4·7	5·5	3·0	4·4	
St. Ann	4·9	4·8	5·4	6·8	5·4	
Byron	4·9	6·0	6·2	5·1	5·5	
Park	4·9	4·9	6·8	8·6	6·3	
St. Mary	4·4	6·3	11·3	5·2	6·8	
SECTION 5.—PHTHISIS.						
Sherwood	2·4	2·3	1·8	1·7	2·0	
Exchange	3·1	2·0	2·4	2·4	2·4	
Castle	2·2	2·4	2·5	3·1	2·5	
St. Mary	2·5	3·5	2·3	2·3	2·6	
Byron	3·4	3·6	2·3	2·9	3·0	
Park	4·1	3·7	3·7	2·7	3·5	
St. Ann	3·1	3·9	4·0	4·0	3·7	

* Death-rates under Five and One year of age. These have been calculated on the total population, and not on the population below five and one year respectively; they are subject, therefore, to certain corrections which might have to be made, after the publication of the census, if there should be any disproportion in the numbers of children below those ages in the several Wards.

TABLE II.

Corrected Death Rates for 1872.

SECTION 1.—ALL AGES.					
		Estimated Population.	Original Number of Deaths.	Corrected Number of Deaths.	Corrected Death Rate.
Sherwood	...	16375	267	287	17·5
Castle	...	7848	171	182	23·1
Park	...	5109	†189	120	23·4
Exchange	...	12138	263	288	23·7
St. Ann	...	24644	766	657	26·6
St. Mary	...	6809	183	195	28·6
Byron	...	15078	404	437	28·9
† General Hospital not deducted.					
SECTION 2.—UNDER 5 YEARS OF AGE.*					
Sherwood	...	16375	87	87	5·3
Park	...	5109	38	35	6·9
St. Ann	...	24644	268	240	9·7
Castle	...	7848	76	78	9·9
Exchange	...	12138	122	123	10·0
Byron	...	15078	197	202	13·3
St. Mary	...	6809	103	105	15·4
SECTION 3.—UNDER ONE YEAR OF AGE.*					
Sherwood	...	16375	64	64	3·9
Park	...	5109	26	26	5·1
St. Ann	...	24644	193	174	7·0
Castle	...	7848	58	58	7·3
Exchange	...	12138	88	88	7·2
Byron	...	15078	134	135	8·9
St. Mary	...	6809	77	78	11·4
SECTION 4.—ZYMOTIC DISEASES.					
Sherwood	...	16375	42	55	3·3
Castle	...	7848	24	36	4·5
St. Ann	...	24644	169	124	5·0
Exchange	...	12138	58	66	5·4
Park	...	5109	44	28	5·4
St. Mary	...	6809	36	41	6·0
Byron	...	15078	77	103	6·8
SECTION 5.—PHTHISIS.					
Sherwood	...	16375	28	29	1·7
St. Mary	...	6809	16	16	2·3
Exchange	...	12138	30	30	2·4
Park	...	5109	14	14	2·7
Byron	...	15078	44	42	2·7
Castle	...	7848	25	25	3·1
St. Ann	...	24644	100	78	3·1

owing to the fact that no record is kept in this institution of the addresses of the patients admitted. However, with the help of one of the Relieving Officers, who has been good enough to go through several of his old "Admission Order Books," and also with the assistance of the Porter, who has been able to afford much supplementary information, I have, in the case of about two-thirds of the number, been able to make the necessary corrections; but the remaining 46, whose addresses cannot be ascertained, I have been obliged to leave to St. Ann's Ward, and the number of deaths registered there are, accordingly, slightly in excess by this number.

But, for 1872, there is another correction required. During this year the Small-pox was prevalent, and cases were received into a temporary hospital erected for the purpose in St. Ann's Ward. The records of this establishment have been fully kept, and I have, consequently, had no difficulty in tracing every case to its proper locality. Read with these corrections,^r Byron and St. Mary's will appear nearly equally bad, while St. Ann's (which, it will be remembered, is somewhat unfairly high), is considerably below the uncorrected death-rate for this year, and still less than the average of the past four years. Sherwood, Castle, and Exchange, have all risen slightly; and Park (the total death-rate of which had been calculated after deductions had been made for the General Hospital) rises from 19 to 23'4.

In the second section, the order is somewhat varied: the differences, also, are more striking: the death-rate in St. Mary's, which is the worst, being three times that of Sherwood, which is the best. Much the same tale is told by the figures in the next section.

In the Zymotic section a considerable change takes place in the order of the list. Thus: Park and St. Ann's, which had previously been by far the worst, become third and fourth; and Byron and St. Mary, which have been accredited with many of the deaths occurring in the public institutions, have rates as high as 6'8 and 6'0.

In the last section of this Table, that devoted to Phthisis, the

(r) No corrections have been necessary in the case of the Coppice Asylum.

numbers are small, and there is no very notable difference. It will be observed, however, that the rate in St. Ann's Ward is considerably reduced, though in that and Castle it is much above that in the other Wards; and all six of them have a death-rate from this disease very much higher than Sherwood.

I now come to the next stage of this enquiry. Having obtained, with tolerable accuracy, the rate of mortality in the several Wards, it appeared to be most desirable that I should submit to your consideration that which exists in other less arbitrary areas. Instead of calculating the death-rate in a Ward, parts of which were placed in very different circumstances, Social and Sanitary, I thought it advisable to estimate them in districts, which I could map out for myself. I, accordingly, applied to you for leave to obtain from the Registrars information with regard to the Enumeration Sub-districts in their ward, which has enabled me to calculate the population for areas of my own manufacture. By separately recording the deaths in these areas, I have been able to arrive at the rate of mortality in each. The following are my four districts:—

1. *Sherwood*. Population, 13,502. Comprises all that part of Sherwood Ward which lies in the New Enclosure, and, also, that part of Park Ward which lies west of Park Row. Dwellings: Villa Residences and superior-class houses.

2. *St. Ann's*. Population, 21,158. Comprises all the new part of St. Ann's and Byron Wards. Dwellings: Chiefly built to comply with the Enclosure Act.

3. *The Meadows*. Population, 7,480. Comprises the new and growing portions of Castle and Exchange Wards. Dwellings: Chiefly built to comply with the Enclosure Act; foundations of some of them not raised to a sufficiently high level. Saturation of the soil, great.

4. *The Old Town*. Population, 44,473. Comprises the old portions of St. Ann's and Byron, Castle and Exchange, with the whole of St. Mary's. Dwellings: Chiefly Back-to-back.

This Table is by far the most valuable of the three, and I must call attention to some of the facts that are elicited. In the first place, in the case of the total death-rate, the most striking

TABLE III.

Death Rates for 1872, in Four Districts.

SECTION 1.—ALL AGES.			
	Population.	No. of Deaths.	Rates per 1000.
Sherwood	13502	202	14·9
St. Ann's	21158	373	17·6
Meadows	7480	157	20·9
Old Town	44473	1388	31·2
SECTION 2.—UNDER 5 YEARS OF AGE.*			
Sherwood	13502	65	4·8
St. Ann's	21158	150	7·0
Meadows	7480	65	8·6
Old Town	44473	591	13·2
SECTION 3.—UNDER ONE YEAR OF AGE.*			
Sherwood	13502	50	3·7
St. Ann's	21158	114	5·3
Meadows	7480	50	6·6
Old Town	44473	406	9·1
SECTION 4.—ZYMOTIC DISEASES.			
Sherwood	13502	37	2·7
St. Ann's	21158	69	3·2
Meadows	7480	25	3·3
Old Town	44473	317	7·1
SECTION 5.—PHTHISIS.			
Sherwood	13502	14	1·0
St. Ann's	21158	41	1·9
Meadows	7480	22	2·9
Old Town	44473	151	3·3

TABLE IV.

*Distribution of principal Zymotic Diseases throughout the Borough
for four years, 1869—1872 inclusive.*

FEVER AND CONTINUED FEVER.							
				1869.	1870.	1871.	1872.
Sherwood				3	13	15	13
St. Mary				3	9	10	3
St. Ann				13	29	26	8
Byron				10	22	16	14
Castle				1	7	9	5
Exchange				4	7	5	10
Park				10	10	12	16
DIARRHOEA.							
Sherwood				13	14	15	17
St. Mary				11	23	17	12
St. Ann				30	18	52	44
Byron				25	30	43	23
Castle				14	9	17	11
Exchange				9	17	25	15
Park				4	1	4	10
SCARLET FEVER.							
Sherwood				16	17	10	1
St. Mary				7	5	2	0
St. Ann				49	34	5	2
Byron				23	27	8	0
Castle				10	12	3	0
Exchange				19	17	1	0
Park				3	5	3	0
SMALL-POX.							
Sherwood				0	0	4	7
St. Mary				0	0	46	15
St. Ann				0	0	36	101
Byron				0	0	22	30
Castle				0	0	4	4
Exchange				0	0	17	25
Park				0	0	14	22

differences are apparent in the several districts, while in Sherwood it is as low as 14'9, in the Old Town it is as much as 31'2. The Sherwood district is, for reasons that I have explained, not quite fairly comparable with the others, but the St. Ann's may, certainly, fairly be compared with the Old Town and "the Meadows." In the first two of these the contrasts are prodigious. In the one there is a mortality but little above the healthy standard, in the other the proportionate number of deaths is frightfully in excess. In the latter there is exhibited a death-rate below five years of age that is nearly double that of the former; and it appears that zymotic diseases, or those that are mostly preventible, number twice as many victims in the Old Town as they do in this portion of the New Town.

The figures that show the mortality from Consumption are of melancholy interest. Here, as might be expected, the deadly effects of a poisoned atmosphere are abundantly evident; and the deaths occurring from this lingering disease are nearly twice as many in the Old Town as they are in the St. Ann's district. But of equally sad import is the recorded death-rate in "the Meadows" district. I would not willingly attach too much importance to figures founded on deaths occurring in one year only, but, knowing the excessive dampness of the soil in the district, knowing, too, that many of the houses have been built, in this neighbourhood, without any precautions being taken to obviate the dangers arising from this condition, I cannot look on it otherwise than as a fact of grave significance that the death-rate from this disease in "the Meadows" is largely in excess of that in the St. Ann's district, which resembles it in every respect except this important one—soil saturation.

Table IV.—In my last Table I have shown the number of deaths occurring in each Ward from four Zymotic diseases.

Of those recorded in the first section, the greater number of which would be cases of Typhoid fever, the deaths seem widely distributed over the town: Sherwood Ward, which shows such a low general death-rate, having lost as many as 44 lives in the four years from this eminently preventible disease. Byron, too, shows a high number. In the case of Park, the General Hospital contributes a share.

Diarrhœa.—The fatality from this affection has been, during the last two autumns, very excessive, and, as will be seen, the numbers occurring in Byron and St. Ann's is proportionately very great. I have analysed these cases for one year (1871), and I find, with hardly an exception, the deaths occurred in infants. In Byron Ward, no less than 26 out of 31 (in the autumn quarter) belong to the Old part of the Ward; while, in St. Ann's Ward, there were 21 in the old part to 12 in the new. This is just as might have been expected: the impurity of the atmosphere, resulting from inefficient night-soil removal, would be more marked in the crowded part of the town.

Scarlet Fever and Small-pox.—These contagious diseases will be seen to have prevailed most in those districts of the town where overcrowding and dirt is greatest. Thus: in 1871, there were no less than 46 deaths from Small-pox in St. Mary's Ward, about thirty times the proportion there was in Sherwood.

CHAPTER VI.

PRESENT PROVISION FOR NUISANCE INSPECTION. DUTIES OF A SANITARY INSPECTOR DEFINED. DESCRIPTION OF PROPOSED DUTIES FOR SANITARY INSPECTORS. SUMMARY AND CONCLUSION.

HAD I been writing a complete Report I should have now entered into a description of the Slaughter-houses, Bake-houses, &c., the Sanitary supervision of which is carried out under special laws and bye-laws; as, however, an account of their condition has been given you from time to time by the Chief Sanitary Inspector, it is not necessary for me to add anything further at present. Under the heading of "Noxious Trades," I should also have discussed fully the disadvantages in the position of certain works, marts, &c., or, speaking generally, those places where processes are carried on which are likely to give rise to nuisances. But this part also of my subject I have deferred going into at present, deeming that the questions involved would be more fitly entered into as special occasion arose.

It only remains for me, therefore, briefly to consider the present position in which you stand with regard to what may be properly termed Sanitary Inspection, or the discovery of such nuisances as may be injurious to health. In the Sanitary Act of 1866 the term nuisance is defined, and is made to include a multitude of things, varying in nature from a smoky chimney to a foul midden or a crowded room. By this and other Acts definite powers are conferred on the Local Authorities for dealing with these same nuisances, and, in order to ascertain their existence, it is indicated that there should be proper persons appointed for the purpose. What means have you then at present for carrying out the provisions of these Acts relating to the Public Health?

You have part of the services of Mr. Richards, who devotes a portion of his time to what may be termed Sanitary Inspection proper. This consists in the supervision of Slaughter-houses, Bake-houses, Hide and Skin Dépôts, &c., in short, all those employments which are liable to give rise to nuisances. In addition to this, he conducts entirely the examination of the meat exposed for

sale throughout the town. But Mr. Richards has a multitude of other duties to perform, mostly connected with the management of the night-soil department, in which he has a considerable share; in fact, I think I may say that the time devoted, one way or another, to the work of this department, is considerably in excess of that which can be given up to Sanitary Inspection proper. When I have said that you have part of Mr. Richards' services, I have described the whole of the means at your disposal for inspecting the vast number of nuisances, of all sorts, existing in the town. You are absolutely unprovided in any other way for ascertaining the existence of conditions injurious to health. Mr. Richards has an assistant, it is true, but he assists him in his capacity of Night-soil Manager, and not in that of Sanitary Inspector.

The Removal of Excrement from a town is an absolute necessity. If the whole town were worked on the Water-closet system, you would look to the Engineer of the Water Company to provide the necessary volume of water to carry it away: if, on a dry system, it were in the hands of a contractor, you would equally look to him to provide entirely for its disposal. The case is in no way different when its management is taken up by a Corporation, which is at the same time the Local Board of Health. The mechanism for its removal should be complete, and should include, not only the necessary plant and staff for its conveyance to the wharf, but also means for ascertaining that the work is efficiently executed. If it should be necessary that applications be made to the Department before Ashpits are emptied, it is also their duty to provide the means for enforcing them.

But the point which it concerns me specially to attend to, is that the term Sanitary Inspection be not applied to a class of work with which, properly speaking, it has nothing to do. The duty of a

(r) With a slight increase in the staff and plant, it would be possible to do the work on the Block system. On this plan, the scavengers would take a particular district in one night, and clear out the whole of the Ashpits. Their time and labour would be immensely economised, and the necessity for keeping up a machinery for receiving applications would be done away with. The advantages of this plan over the present one are so obvious, that I am quite at a loss to understand why it has not been adopted.

Sanitary Inspector is to discover a nuisance, whether it arises from an overflowing Ashpit, or one that is foul from the admission of water. In the one case, he represents a fault to the head of the Night-soil Department, in the other he serves the landlord, whose duty it is to provide an Ashpit of proper construction, with a notice. In either case, the one set of duties are distinct from the other.

After what I have said about the nuisances of overcrowding, and inefficient excrement storage and removal, I feel that it is quite unnecessary for me to urge upon you the advisability of at once providing yourselves for their proper inspection. Having pointed out an alarmingly high death-rate from Zymotic diseases generally, in the crowded parts of the town, and the constant existence in its different parts of Typhoid Fever and Diarrhœa—the latter of which is, undoubtedly, in great measure due to the poisoning of the air with decomposing excrement—I feel that it would be quite superfluous for me to add more. I now, therefore, after careful consideration, lay before you the recommendations that I have to make with regard to the proposed Sanitary Inspection.

1.—I have, in the first place, to suggest that all nuisances, such as smoky chimneys, which have nothing to do with the health of the people, should be carried on by others than Sanitary Inspectors.^s

2.—I have also to recommend that Mr. Richards be allowed to abandon his present engagement in the Night-soil Department, and devote the whole of his time, instead, to Sanitary Inspection. He, as Chief Sanitary Inspector, would take under his special charge the inspection of all those trades and occupations that are likely to give rise to conditions injurious to health. He would, also, be able to inspect thoroughly the Meat and Cattle Markets. As Inspector under the Adulteration of Food Act, he would be occasionally engaged in collecting samples to be submitted to the Borough Analyst. In addition to this, his services would always be at the disposal of the Department, and his great knowledge of the town, and of conditions that give rise to nuisances, would be quite invaluable in carrying out Sanitary work.

(s) Smoky Chimneys. Arrangements have been made, I believe, for this department of inspection being in the hands of the Police.

3.—I should also recommend the appointment of two Sanitary Inspectors, a Senior and a Junior.

I should propose to allot to each of these a district, within which he would be required to inspect nuisances existing in all Lodging Houses' (not under the Common Lodging Houses Act) and sub-let houses, either from want of ventilation, over-crowding, or dirt.

To see to the state of all Middens, Water-closets, the Trappings of Drains, the Water Supply of all houses, Accumulations of Filth, &c.

He would also be required to inspect the Fish.

It would be necessary for him to keep a diary, in which he would enter all nuisances that he has discovered during the day.

His day's work would be somewhat as follows:—From 9 to 10 he would enter from his diary, into a book kept for the purpose, a list of the nuisances that he had discovered the day before, and an account of the action he has taken in each case. He would, also, in the case of some nuisances, that had been reported a week or so before, note what steps had been taken to abate the nuisance, and, if nothing had been done, he would enter it in another book along with cases that were to be brought before the Sanitary Committee.

At 10 o'clock he would bring me the book, which I should examine, and he would report to me any special case which he wished to draw my attention to. At 10.30 he would start on his rounds, and he would first go and deliver notices for the abatement of such nuisances as he had discovered the previous day. He would then (unless directed by me to visit some neighbourhood in which disease was specially prevalent) inspect a particular locality (on a systematic plan), noting the presence of nuisances of all sorts. This inspection would be continued in the afternoon, but one hour, at least, of the afternoon would be devoted to entering the rough notes, taken in pencil, into his diary. During this hour, and also during the hour in the morning, he would be at the office ready to

(1) The houses licensed as Common Lodging Houses should, for many reasons, be inspected by the Police. In these houses definite instructions are given for their mode of conduct, and it is merely a question of seeing that the bye-laws are attended to in each case. This a policeman would be perfectly competent to do, and the advantages of having them under inspection at night, as well as at day, are, of course, very great.

receive any complaints that might be brought in. These complaints would be entered in a special book, and it would be his duty to visit the spot the next morning when on his rounds, or earlier, if necessary.

This would be the ordinary routine of his duty, but there are a multitude of other ways in which he would be of use to me. Thus, in the case of infectious diseases, where the lime-washing of premises was necessary, he would take the necessary steps to get them done; he would give notice as to removal of dead bodies, &c.

It would be advisable to fill the senior of these posts with a thoroughly-competent man. It is not absolutely necessary that he should have had previous experience of the work, but it is certainly advisable that he should be able readily to acquire a knowledge of it. His responsibilities would be considerable, and he would be required to give evidence before the magistrates as to the existence of nuisances of all descriptions.

The junior of these posts might, if you think fit, be filled by Chetwin, the present messenger, who has hitherto been in the employment of the Night-soil Department. His very industrious and painstaking qualities may, in time, make him an efficient Sanitary Officer.

In conclusion, I will pass briefly in review the several points which I have brought before your notice in this Report.

In my last chapter, I have discussed fully the mortality in different parts of the town, and pointed out the fallacy of assuming too much on total death-rates. I have shown that the deaths occurring in some parts of the town are very much higher than in others, and that they are, presumably, greater still among children and infants; and that, in these same parts, the deaths from Infectious Diseases are largely in excess of those occurring in others. I have also called attention to the fact, that there has, for the last few years, existed a considerable amount of that eminently preventible disease, Typhoid Fever, scattered over various parts of the district. And with regard to the fatality from one special disease, Phthisis, the evidence tends to show that, in two separate parts, apparently from different causes, the mortality is raised.

In my three first chapters, I have entered into questions connected with the causation of these inequalities under the several headings of Water Supply, Excrement Removal, Dwelling Accommodation,

In connection with the first of these, Water Supply, I have given it as my opinion, that none of the wells sunk in the Sandstone Rock, in the midst of an inhabited area, are proper sources for drinking supply: and I consider that the only safe course to adopt, not only with these wells in the town, but also with the Sion Hill Well, which is under precisely the same conditions, is to abandon them altogether. And, further, with regard to the supply from the Water Works Company, I have stated the strong evidence there is to show that two of the sources—that from the Scottholme Springs and the Trent Reservoir—are most decidedly unfit for use; but, as the Company have not granted me information with regard to the distribution of their different supplies, I am unable to say how much of the population of the borough derives its drinking water from these highly-polluted sources, and how far the otherwise pure water from Bagthorpe is contaminated.

I now repeat, that, in my opinion, the withholding of such information is highly prejudicial to the Public Health interests of the town; and that, as long as there are cases of Typhoid Fever in the town, it will be impossible to say, in the absence of all knowledge as to its distribution, that the water supplied by the Company has not some share in their causation.

Excrement Disposal.—Under this heading I have considered its methods of collection and removal. I have pointed out, in the first place, that many of the Middens existing in the town are of such construction as to be intolerable nuisances and decidedly injurious to health; I have, in the next place, called your attention to the fact that the present provisions for removal appear to be quite inadequate; frequency of removal is the essential condition of all the dry systems, and I must unhesitatingly say that in this respect it appears to me that the means fall far short of the requirements. If an alteration in the present arrangement be demurred to on the ground of expense, it is my duty to represent to you that a small saving of money would, in this instance, be, undoubtedly, balanced by a considerable sacrifice of life and health.

At the same time, having regard to the importance of this question, I have ventured to suggest that a Committee, or Sub-Committee, be specially appointed to consider the whole question of Excrement Removal and Disposal.

I have next treated, at some length, the subject of House Accommodation. I have described the great Sanitary defects that exist in different parts of the Old Town in respect to ventilation, and in regard to these and the nuisance of over-crowding, I have stated the great need that there is for carrying out the laws relating to them. I have urged this all the more strongly because I am convinced that there is no real difficulty in their application, if only sufficient moderation be exercised in the requirements, and steadiness of purpose be evinced in carrying out the law.

In further alluding to the accommodation in the New Town, I have put before you the inadequacy of the present building regulations to meet the wants of this prosperous Borough. I have, also, expressed a hope that the question of affording suitable accommodation for particular classes of the community, is one that may engage your attention.

Finally, I have endeavoured to give effect to these suggestions by presenting to you, in as practical a form as possible, a scheme for the future carrying out of Sanitary work. Throughout I have attempted to give a practical bearing to my suggestions, and I have carefully avoided hazarding any recommendation that I do not think capable of being put into effect.

I have had no hesitation in putting these matters plainly before you, knowing full well that you will take them in the spirit they are intended. The work that you, as the representatives of the Local Board of Health, have now for some years been engaged in, has been steadily directed to the benefit of the town; indeed, there exists everywhere abundant evidence of their beneficial results. Encouraged by the manifestations that I have witnessed of your evident desire to perform, conscientiously, the duties imposed on you as the trustees of the Public Health, I have laid before you suggestions that I trust you will consider reasonable. I now urge their adoption respectfully, but with confidence, resting assured, in my own mind, that when satisfied that you will thereby be effecting a substantial improvement in the Sanitary condition of the Borough, you will do all in your power to promote the health, the happiness, and comfort of its people.